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10/643,563

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Wei Li

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EXAMINER

AHN, SANGWOO

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/643,563	<b>Applicant(s)</b> LI ET AL.	
	<b>Examiner</b> SANGWOO AHN	<b>Art Unit</b> 2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 23 – 24, 26 – 29 and 37 - 50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23 – 24, 26 – 29 and 37 - 50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20090708</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

Claims 23 – 24, 26 – 29 and 37 - 50 are pending.

Claims 23 – 24, 26 – 29 and 37 – 39 have been amended.

Claims 1 – 22, 25 and 30 – 36 have been canceled.

Claims 40 – 50 have been added.

**Particularly, the amendments made to claims 23 and 38 comply with the requirements set forth in the previous Office Action's Allowable Subject Matter section. Therefore, claims 23 and 38 are allowable.**

### ***Response to Arguments***

**Applicant's arguments with respect to claim 37 have been fully considered but they are not persuasive.**

Applicant mainly argued that the references fail to teach “wherein the conditions include how busy a computer system ... currently is. Examiner respectfully traverses the argument.

As indicated in the Office Action mailed on 2/2/2009, Examiner contends that Agrawal in view of Agrawal2 teaches all of the aforementioned limitations in the following way:

Agrawal teaches “dynamically selecting which occurrence counting technique to use from a plurality of available occurrence counting techniques based on conditions

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existing in a computing environment in which the frequent itemset operation is to be performed (C12:L21-32, First, I/O normally refers to transferring data, so the I/O cost can be interpreted as the cost of transferring data. Second, workload of a computer system, how busy a computer system is and resources available on a computer system are all related to the amount of data and data activity within the system. The cost estimation in Agrawal is based on a number of data characteristics like the number of items, total number of transactions, average length of a transaction, etc. These parameters suggest that the cost estimation is essentially based on how much data is being transferred (number of transactions), workload (number of transactions, average length of transactions) and resources available (the more the number of items or transactions, the less the available resources → also pertains to volatile memory available as the memory is also a resource). The recited conditions on which the cost estimation is based are widely applied in the data processing art to be the purpose of “cost estimation” within the computing environment, which is to lessen the workload and to increase the available resources, et seq.), wherein the conditions include how busy a computer system in which the frequent itemset operation is to be performed currently is, and an amount of volatile memory available to store a candidate prefix tree (C11:L17-33, First, I/O normally refers to transferring data, so the I/O cost can be interpreted as the cost of transferring data. Second, workload of a computer system, how busy a computer system is, and resources available on a computer system are all related to the amount of data and data activity within the system, et seq.).”

Agrawal2 teaches that “conditions used in selection process are which occur before the actual operation is performed (column 2 line 65 - column 3 line 7: the total cost of the workload is calculated, several different sets of Indexes and materialized views are measured in this manner to find the best set since building them can be very expensive due to updates and storage constraints, column 7 lines 49 - 54, et seq.).”

For the foregoing reasons, rejection of claim 37 is hereby sustained.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,324,533 issued to Rakesh Agrawal et al. (Agrawal) in view of U.S. Patent Number 6,513,029 issued to Sanjay Agrawal et al. (Agrawal2).

Regarding claim 37, Agrawal discloses,

A method comprising performing a machine-executable operating involving instructions, wherein the machine-executed operation is at least one of:

A) sending said instructions over transmission media (Figure 1, column 4, et seq.);

B) receiving said instructions over transmission media (Figure 1, column 4, et seq.);

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C) storing said instructions onto a machine-readable storage medium (Figure 1, column 4, et seq.); and

D) executing the instructions (Figure 1, column 4, et seq.);

wherein said instructions are instructions which, when executed by one or more processors, cause the performance of a frequent itemset operation by performing the steps of:

dynamically selecting which occurrence counting technique to use from a

plurality of available occurrence counting techniques based on

conditions existing in a computing environment in which the

frequent itemset operation is to be performed (C12:L21-32, *First,*

*I/O normally refers to transferring data, so the I/O cost can be*

*interpreted as the cost of transferring data. Second, workload of a*

*computer system and resources available on a computer system*

*are all related to the amount of data and data activity within the*

*system. The cost estimation in Agrawal is based on a number of*

*data characteristics like the number of items, total number of*

*transactions, average length of a transaction, etc. These*

*parameters suggest that the cost estimation is essentially based on*

*how much data is being transferred (number of transactions),*

*workload (number of transactions, average length of transactions)*

*and resources available (the more the number of items or*

*transactions, the less the available resources → also pertains to*

*volatile memory available as the memory is also a resource). The recited conditions on which the cost estimation is based are well known in the data processing art to be the purpose of “cost estimation” within the computing environment, which is to lessen the workload and to increase the available resources, et seq.), wherein the conditions include workload of a computer system in which the frequent itemset operation is to be performed, and an amount of volatile memory available to store a candidate prefix tree (C11:L17-33, First, I/O normally refers to transferring data, so the I/O cost can be interpreted as the cost of transferring data. Second, workload of a computer system and resources available on a computer system are all related to the amount of data and data activity within the system, et seq.); and*

during said frequent itemset operation, using said selected occurrence counting technique to count occurrences of at least one combination to determine whether said at least one combination satisfies frequency criteria associated with said frequent itemset operation (C3:L23-24, et seq.).

Agrawal does not explicitly disclose that conditions are which occur before the actual operation is performed.

However, Agrawal2 discloses that conditions used in selection process are which occur before the actual operation is performed (column 2 line 65 - column 3 line 7: the total cost of the workload is calculated, several different sets of Indexes and materialized views are measured in this manner to find the best set since building them can be very expensive due to updates and storage constraints, column 7 lines 49 - 54, et seq.). At the time of the invention, it would have been obvious to a person of ordinary skill in the data processing art to modify Agrawal's method of selecting itemset counting technique to incorporate Agrawal2's method of using conditions which occur before the actual operation such as workload and storage constraint, thus enabling system which provides better recommendations and which makes the selection process faster.

Regarding claim 39, Agrawal discloses determining that a particular occurrence counting technique will not be considered during any phase of the frequent itemset operation, and performing the frequent itemset operation without performing startup operations for said particular occurrence counting technique (C11:L40-44, et seq.).

Regarding claim 40, Agrawal discloses The machine-implemented method of Claim 37, wherein: the frequent itemset operation is performed in at least a first phase and a second phase; the first phase is associated with combinations that have a first number of items; the second phase is associated with combinations that have a second number of items; and the occurrence counting technique selected for the first phase and the occurrence counting technique selected for the second phase are different (Abstract, C2:L38 – C3:L25, et seq.).



Regarding claims 47, 49 and 50, Agrawal discloses a volatile or non-volatile computer-readable storage medium storing one or more sequences of instruction, wherein execution of the one or more sequences of instruction by one or more processors causes the one or more processors to perform the machine-implemented method of Claims 37, 39 and 50 (Figure 1, et seq.).

### ***Allowable Subject Matter***

2. Claims 23 and 38 contain allowable subject matter (reasons for allowance as indicated in the previous Office Action mailed on 2/2/2009), as all the requirements set forth in the previous Office Action have been complied with. Accordingly, dependent claims 24, 26 – 29, 41 – 46 and 48 are also allowable due to dependency.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANGWOO AHN whose telephone number is (571)272-5626. The examiner can normally be reached on M-F 10-6.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

8/3/2009

/S. A./

Examiner, Art Unit 2168

/Tim T. Vo/

Supervisory Patent Examiner, Art Unit 2168